

IN THE UNITED STATES DISTRICT COURT
FOR THE SOUTHERN DISTRICT OF NEW YORK

MONIB ZIRVI
19 Major Rd
Monmouth Junction,
NJ 08852

NO. _____

And

CIVIL ACTION

MATTHEW LUBIN
2 Magnolia Drive
Rye Brook
NY 10573-1820

And

MARIA KEMPE
Sundspromenaden 1
SE-21116 Malmö
Sweden

COMPLAINT

Plaintiffs
vs.

JAY T. FLATLEY
5200 Illumina Way
San Diego,
California 92122

JURY TRIAL DEMANDED

ILLUMINA, INC.,
5200 Illumina Way
San Diego,
California 92122

And

DAVID R. WALT
Center for Life Science Bldg
3 Blackfan Circle
Boston, MA 02115

And

STEPHEN P.A. FODOR
3183 Porter Drive
Palo Alto, CA 94304

And

KEVIN GUNDERSON
11125 Flintkote Ave., Suite B
San Diego, CA 92121

And

JIAN BING FAN
5247 Pearlman Way,
San Diego, CA 92130

And

MARK CHEE
11125 Flintkote Ave., Suite B
San Diego, CA 92121

And

AFFYMETRIX d/b/a as a part of
THERMO FISHER SCIENTIFIC
168 Third Avenue,
Waltham,
MA 02451

And

APPLIED BIOSYSTEMS
d/b/a brand of
THERMO FISHER SCIENTIFIC
168 Third Avenue,
Waltham,
MA 02451

Defendants.

I. INTRODUCTION

1. Dr. Monib Zirvi graduated from Princeton University in 1993 and was accepted to an NIH sponsored Medical Scientist Training Program Fellowship which funded both an MD and PhD. He met Dr. Francis Barany in August 1994 and joined Dr. F. Barany's laboratory at Cornell University Medical College (now Weill Cornell Medicine) to complete his PhD. He was a critical member of the team which created the breakthrough Trade Secrets which were purloined by the Defendants and which are now the subject of this litigation. Dr. Monib Zirvi, using rules and procedures developed in concert with Dr. Francis Barany, created sets of unique man-made (non-naturally occurring) DNA sequences which had unique properties which were dubbed "zip code" or "zipcode" sequences. In February 1999, Dr. Zirvi created 465 such zip code unique sequences. Each sequence was designed to have specific properties for use in the design of Universal DNA Arrays, which were invented and named by the Barany team. The Barany team also coined and used the terms "Universal DNA Microarrays", "Zip Code Arrays", "Universal Zip Code Arrays", "Universal Addressable Arrays", "Universal Arrays", "Programmable Arrays", or "Programmable DNA Chips" to describe "Universal DNA Arrays". The sequences themselves and the various uses of the Universal DNA Arrays were trade secrets and contained proprietary information.

2. Further, most of these trade secrets were originally explained, as a detailed roadmap, in a strictly confidential grant proposal to the National Cancer Institute. Plaintiff Dr. Matthew Lubin, then Director of Medical Genetics at Strang Cancer Prevention Center was an integral part of this grant proposal. This 'roadmap' was illegally purloined and exploited to enrich the Defendants, as fully explained herein.

3. Dr. Maria Kempe obtained her Master of Science degree from Lund Institute of Technology/Lund University, Lund, Sweden and in 1989 started her PhD in the Department of Pure and Applied Biochemistry. From mid-July, 1994 till the end of July, 1996, she did her postdoctoral work in Dr. George Barany's laboratory at the Department of Chemistry, University of Minnesota and was involved, during this time, in developing surfaces and linker chemistry for the arrays. These trade secrets were also misappropriated by the Defendants.

4. Defendants either by themselves or in concert stole these proprietary and protected trade secrets and, willfully disguising or ignoring their intellectual provenance, tried again and again to re-patent them, occasionally swearing under oath that the discoveries and inventions were theirs.

5. All Defendants conspired to illegally enrich themselves to the tune of hundreds of millions of dollars by taking credit for breakthroughs which they either did not make or which, without the theft of Plaintiffs' trade secrets, would not have been possible.

6. As explained herein, because the Defendants continually covered their illegal tracks, Plaintiffs only discovered the first of these unlawful appropriations on August 3, 2015. Thereafter, additional illegal actions were investigated. Plaintiffs now bring this timely complaint for Racketeering and other unlawful conduct.

II PARTIES

7. Plaintiff Dr. Monib Zirvi is a citizen of the State of New Jersey.

8. Plaintiff Dr. Matthew Lubin is a citizen of the State of New York.
9. Plaintiff Dr. Maria Kempe is a citizen of Sweden.
10. Defendant Jay T. Flatley is a citizen of the State of California and the Executive Chairman of Defendant Illumina Inc.
11. Defendant Stephen Fodor is a citizen of the State of California. He was previously employed at Defendant Affymetrix Inc.
12. Defendant David Walt is a citizen of the Commonwealth of Massachusetts and a co-founder of Defendant Illumina Inc.
13. Defendant Mark Chee is a citizen of the State of California and is currently an employee and officer of Encodia. He was previously employed at Defendant Affymetrix Inc. He was previously employed at and was a co-founder of Defendant Illumina Inc.
14. Defendant Kevin Gunderson is a citizen of the State of California and is currently an employee and officer of Encodia. He was previously employed at Defendant Affymetrix Inc. He also was previously employed at and was a co-founder of Defendant Illumina Inc.
15. Defendant Jian-Bing Fan is a citizen of the State of California and is currently an employee and officer of AnchorDx. He was previously employed at Defendant Affymetrix Inc. He also was previously employed at and was one of the original employees of Defendant Illumina Inc.
16. Defendant Illumina is a corporation of the State of Delaware with a principal place of business in the State of California.

17. Defendant Affymetrix is currently owned by and is a part of Thermo Fisher Scientific, a Delaware corporation with its principal place of business in the State of California.

18. Defendant Perkin-Elmer/Applied Biosystems is currently the Life Technologies Division of Thermo Fisher Scientific, a Delaware corporation with a principal place of business in the State of California and the successor in interest to P.E. Biosystems.

19. By way of background, P.E. Biosystems Group, an integral player, in the theft of the trade secrets as described herein, changed its name to the Applied Biosystems Group on November 30, 2000.

20. Prior to this name change, in 1993, The Perkin-Elmer Corporation of Norwalk , CT, merged with Applied Biosystems , Inc., which was founded in Foster City, CA, in 1981.

21. In 1998, Perkin-Elmer consolidated its premier life science technologies into the P.E. Biosystems division, consisting of Applied Biosystems , PerSeptive Biosystems , Tropix and P.E. Informatics.

22. This company had acquired PerSeptive Biosystems, a company focused on the analysis of proteins, in 1998 and Tropix, Inc., a chemiluminescence company, in 1996. Informatics was formed by combining two acquired entities, Molecular Informatics and Nelson Analytical Systems, with existing units of Perkin-Elmer which was recapitalized under the name P.E. Corporation in 1999.

23. As part of this recapitalization, the company established two new classes of common stock that track the Applied Biosystems Group and the Celera Genomics

Group. The company also sold its analytical instruments division and the Perkin-Elmer name, which was most closely associated with that business.

24. At the Company annual meeting on October 19, 2000, stockholders approved the name changes from P.E. Corporation to Applera Corporation and from the P.E. Biosystems Group to the Applied Biosystems Group.

25. Affymetrix, Inc., was an American company that manufactured DNA microarrays; it was based in Santa Clara, California, United States. The company was acquired by Thermo Fisher Scientific in March 2016.

26. The company was founded by Defendant Stephen Fodor in 1992. It began as a unit in Affymax N.V. in 1991 by Fodor's group, which had in the late 1980s developed methods for fabricating DNA microarrays, called "GeneChip" according to the Affymetrix trademark, using semiconductor manufacturing techniques. The company went public in 1996.

27. On January 8, 2016, Thermo Fisher Scientific announced the acquisition of Affymetrix for approximately \$1.3 billion. The acquisition closed on March 31, 2016.

III JURISDICTION and VENUE

28. Plaintiff incorporates by reference the allegations set forth in the preceding paragraphs of the Complaint as though set forth at length herein.

29. This Court has jurisdiction over this matter pursuant to 28 U.S.C. § 1331 (federal question jurisdiction) as federal district courts have original jurisdiction of all civil actions arising under the Constitution, laws, or treaties of the United States.

30. In particular, with respect to subject matter jurisdiction, The Defend Trade Secrets Act of 2016 (DTSA) (Pub.L. 114–153, 130 Stat. 376, enacted May 11, 2016, codified at 18 U.S.C. § 1836, et seq.) and RICO (18 U.S.C. §§ 1962 et seq) give this district court the jurisdiction to adjudicate a civil action for relief as may be appropriate. 29 U.S.C.S §412.

31. Venue is properly laid in this district pursuant to 28 U.S.C. § 1391(a)(2) because a substantial part of the events giving rise to the claims set forth herein occurred in this judicial district.

IV FACTUAL STATEMENT

A. Background

32. In the past few decades, scientists have made remarkable strides in understanding cancers.

33. Human bodies are composed of around 30 - 40 trillion cells and each of those cells contains 23 chromosome pairs, which store DNA.

34. The DNA in each cell comprises some 6 billion “bases”, known as “A”, “C”, “G”, and “T”, and it is their precise order which serves as a blueprint for the body, teaching each cell to perform its proper function.

35. The DNA in the body is composed of two strands of “complementary” sequence, in other words, wherever there is an “A” it pairs with a “T”, wherever there is a “G” it pairs with a “C”, and vice-versa.

36. This complementary property of DNA enabled the development of fundamental new technologies known as the “polymerase chain reaction” or PCR by the Cetus group in the late 1980’s, and the “ligase chain reaction” or LCR by Dr. F. Barany

in 1991 to amplify, detect, and identify DNA from biological samples. These technologies use short pieces of man-made DNA called “oligonucleotides” [known as “primers” and “probes”] as well as special heat-loving enzymes known as thermostable DNA polymerase and thermostable DNA ligase to make copies of the DNA target.

37. Cancers arise when there is a mistake or error (known as a “mutation”) in the DNA code, such as an “A” mutating to a “C” – sometimes the mistake is known as a “germline mutation”, meaning it is inherited and present in all cells in the body, putting the children also at risk of getting cancer. Sometimes the mistake is known as a “somatic mutation,” meaning it is present in only some of the cells and may arise, for example, from carcinogens in smoke, exposure to toxic chemicals or to UV rays from the sun.

38. By the early 1990’s, there were innovative approaches to try to identify the mutations which caused cancer, as well as the changes that could guide treatment decisions or predict outcome. As an example, breast cancer patients that have extra copies of a gene known as Her2/Neu are more responsive to a drug called “Herceptin”. Thus, the ability to accurately detect mutations or copy changes can help save lives.

39. However, the techniques were deficient in finding low levels of mutations for early detection of cancer, mutations, single-nucleotide polymorphisms (i.e. SNPs), and copy changes in clinical samples such as biopsies, and/or were not very accurate.

B. The First Appropriation of Plaintiff’s Commercial Trade Secrets

40. In general, the form of the information qualifying as a trade secret under the DTSA is extremely broad, and includes information of any form, regardless of “how stored, compiled, or memorialized physically, electronically, graphically, photographically, or in writing,” and of any type, “financial, business, scientific,

technical, economic, or engineering information,” so long as: (1) the information is actually secret, because it is neither known to, nor readily ascertainable by, another person who can obtain economic value from the disclosure or use of the information; (2) the owner has taken “reasonable measures” to maintain the secrecy; and (3) independent economic value is derived from that secrecy” The DTSA also provides that information “stored” only in an individual’s memory can be the subject of a civil claim for theft of trade secrets.

41. The value of a trade secret consists of it not being known to others. Thus, “the right to exclude others is central to the very definition of the property interest.” (DTSA).

42. From the early 1990’s to November 1993, Dr. Francis Barany, an academic professor at the Cornell University Medical College, Dr. George Barany and Dr. Matthew Lubin, (hereinafter referred to as the Barany Team) conceived of, made improvements upon, and designed primers and probes for PCR-LDR, PCR-PCR-LDR, PCR-RE-LDR, LDR-PCR, and zip code universal arrays for identifying nucleic acids or DNA changes to enable detection of infectious diseases, inherited diseases, and cancer-related genetic alterations.

C. The Plaintiffs’ Grant Proposal to the National Cancer Institute

43. In order to advance their research, in February 1994, the Barany Team, submitted a \$6,995,293 landmark grant proposal (NCI Grant Proposal) to the National Cancer Institute (NCI) of the National Institute of Health (NIH).

44. This proposal described a radical new idea of “Universal Addressable Arrays” – ones where the information was encoded by “zip code sequences”, and the

mutations would be detected using powerful enzymes called “Ligases” to provide unprecedented accuracy for finding low-abundance mutations.

45. In layman’s terms, the “Universal Addressable Array” is like a cell phone that can run or decode different programs like the “Enigma Machine” which decoded secret messages in WWII, and the enzyme reactions are different types of “Apps” which would work on that cell phone.

46. With this powerful new “Enigma Machine” and the multiple “Apps” described in detail in the proposal, the Barany team could begin the process of helping doctors and patients with the above-mentioned cancer concerns.

47. The Proposal stated in relevant part;

The long-range objective of this proposal is to develop sensitive and specific approaches to the detection and simultaneous identification of cancer-related, genetic alterations. Mutations and genetic aberrations have been implicated, at various steps, in the etiology and biology of tumors. Inherited mutations account for the predisposition to cancer in some families. Somatic mutations in tumor suppressor genes, oncogene amplification and viral DNA sequences have been found in cancers as well. However, the clinical use of these discoveries and research into their clinical significance has been slowed by the laborious processes by which they are detected. To apply these discoveries and explore the interactions of multiple genetic alterations, we urgently need a new technology, which is capable of being automated and has the power to detect any of a vast number of mutations.

In response to the urgent need for new methods of mutation detection, we have assembled a team of investigators whose

expertise will be directed toward innovative solutions to this problem. The collaborative nature of the scientific and organizational infrastructure will facilitate the attainment of the projects' specific aims and objectives.

The specific aims of the five projects in this proposal are to: (i) develop a multiplex polymerase chain reaction/ligase detection reaction (PCR/LDR) system for the detection of inherited mutations in germline DNA and somatic mutations in tumors; (ii) develop a ligase detection reaction, polymerase chain reaction (LDR/PCR) system for detecting gene amplifications and deletions in tumors; (iii) develop a PCR/restriction enzyme/LDR (PCR/RE/LDR) system for detecting and identifying mutations in rare cancer cells at a sensitivity of 1 in 10^5 or 1 in 10^7 by removing normal DNA sequences and selectively amplifying cancer mutations; (iv) design and synthesize nucleotide analogues for converting specific DNA sequences into restriction endonuclease recognition sites for PCR/RE/LDR mutation detection; (v) engineer a thermostable ligase with greater fidelity to enhance LDR and LCR specificity; (vi) design and synthesis oligonucleotide or peptide nucleic acid (PNA) addressable arrays for the simultaneous detection of multiplex LDR and LCR products; and (vii) explore the ability of these technologies to further our understanding and clinical management of lung, colon, breast and cervical cancers.

This NCI Grant Proposal provided a radical series of novel and proprietary ideas; essentially a “roadmap” to the creation of a transformative approach to the field.

In particular, the trade secrets were, among others, the following;

I. A design for a novel array called the “Universal Addressable Array” which would contain sets of man-made designed DNA sequences, the Barany team named as “zip codes” or “complementary zip codes” which could be used to address and encode individual locations in a grid pattern on the array. Further, “zip codes” or “complementary zip codes” were appended to primers and probes to guide them to the proper location or process. This would mimic how RAM (random access memory) in a computer works, wherein a specific piece of information is stored in a specific location.

II. New DNA base analogues or molecules that would work differently than those naturally found in various enzymatic tests or “Universal Addressable Arrays” then being developed.

III. Using a ligase enzyme, and/or additional enzymes to detect single nucleotide polymorphisms (SNPs), mutations, and/or copy changes in various combinations with existing PCR reactions. These would produce a variety of procedures and information including PCR/LDR, PCR/PCR/LDR, PCR/RE/LDR, and LDR/PCR which are analogous to the Apps on a Smart Phone or a Computer (as previously described).

IV. Designed sets of zip code sequences (among the first robust sets of which were the 4633 and 465 later designed and created by the Plaintiff Monib Zirvi using rules that were created by the Barany Team). The rules used to create these were proprietary procedures and information but contained in the 1994 NCI Grant Proposal.

48. One of the proprietary concepts, as enumerated above, was that of the design and operation of an “Universal Addressable Array” – one where the information was encoded by specially designed man-made sequences dubbed “zip code sequences”

and a series of procedural steps designed by the inventors in the NCI Grant Proposal to detect mutations using innovative and proprietary combinations of powerful enzymes called “Ligases” to provide unprecedented accuracy for finding rare and low level mutations.

49. In short, the NCI Grant Proposal contained trade secrets and proprietary information which included not only the Universal Addressable Arrays themselves, but also the unique design of the zip code sequence and the conditions to make them function well. The Barany team zip codes [analogous to the US Postal ZIP codes] may be used to: (i) Identify or direct a group of targets [analogous to first digit identifies a general area of the country]; (ii) Identify an oligonucleotide destination [analogous to the address of a building]; and (iii) Direct oligonucleotides to that destination [analogous to the addressing of mail].

50. In essence, each zip code sequence was designed to operate similarly to the way the transistor functions in a computer chip. By combining these zip code sequences or their complements into large arrays, as well as using zip code primers and probes, numerous samples and genetic changes could be analyzed simultaneously. Examples of uses of the Barany team zip codes [with analogous examples for the US Postal code ZIP codes] include: (i) Identifying or barcoding targets or sequences arising from a given sample [analogous to First digit of “1” in postal code covers New York and Pennsylvania state]; (ii) Identifying or co-amplifying a set of ligation products [analogous to sending letters to all personnel on a mobile aircraft carrier]; (iii) Identifying nearby, adjacent, or individual mutations in an important gene or group of genes [analogous to sending letters to multiple apartments within multiple buildings in a New York City

building complex]; (iv) Identifying two different mutations at a given locus using a single zip code [analogous to sending two different packages to two different people living at the same address]; and (v) Identifying targets by virtue of being coupled to given zip codes [analogous to delivering packages to US soldiers at a forward operating base (FOB) in Afghanistan].

51. The NCI Grant Proposal contained commercial trade secrets which had not yet been patented and which were submitted in strict confidence pursuant to the confidentiality agreements signed by members of the NCI review panel.

D. Stephen PA Fodor, One of NCI's Grant Reviewers, Appropriates Plaintiffs' Trade Secrets.

52. On June 1, 1994, the Plaintiffs' NCI Grant Proposal, known as a Program Project Grant, was reviewed during a site visit in New York, by a panel of experts selected by the NIH.

53. The panel included the peer reviewer Defendant Stephen P.A. Fodor (Fodor) who was then the Chief Technology Officer of Affymetrix (a company later purchased by Defendant Thermo Fisher Scientific).

54. Confidentiality in NIH peer review **prohibits** a peer reviewer member from, inter alia, sharing applications, proposals, or meeting materials with anyone who has not been officially designated to participate in the peer review process; **using information contained in an application or proposal for his/her personal benefit or making such information available for the personal benefit of any other individual or organization.** (Emphasis added).

55. In fact, reviewers must sign, under penalty of perjury, 18 U.S.C. §1001, a confidentiality certification before gaining access to applications, proposals, and meeting

materials. In addition, for Program Project Grants, the reviewers also sign a second document after the review process, again certifying they have no scientific or commercial conflict of interest.

56. Fodor knew he was subject to the foregoing restrictions and obligations pursuant to the confidentiality agreements he signed with the NIH both before and after reviewing the NCI Grant Proposal

57. Fodor, realizing the huge commercial and scientific implications of the NCI Grant Proposal and desiring to appropriate it for his own commercial gain obstructed the Barany Team from getting this grant.

58. He did this by awarding the project section which described the “Universal Addressable Array” such a poor score, that it overwhelmingly contributed to the Barany team not getting funding for the NIH grant and it hindered progress, almost certainly causing needless loss of life in the process.

59. As will become clear later, Fodor considered this portion of the grant proposal so valuable that his company, Defendant Affymetrix., either directly or through its agents and/or its employees repeatedly tried to re-patent this discovery for themselves and appropriated the technology.

E. Fodor Uses His Employees to Aid the Misappropriation and Exploit It.

60. Shortly after Defendant Fodor had read the NCI Grant Proposal, it did not take him long to appropriate the trade secrets contained within it.

61. To do this, he used Defendants Mark Chee, Jian-Bing Fan, and Kevin Gunderson, the employees he supervised at Defendant Affymetrix.

62. The first attempt to capitalize on Fodor's misappropriation was on October 26, 1994, in patent application US6156501, where Defendant Mark Chee, with Affymetrix as an assignee, attempted unlawfully and without authorization, to patent the ideas Defendant Fodor had learned about when he 'reviewed' the NCI Grant Proposal.

63. Fodor deliberately removed himself as a co-inventor of the October 26, 1994 patent application, in order to conceal his theft of the NCI Grant Proposal, which was proprietary to Dr. Francis Barany and Plaintiff Lubin. The October 26, 1994 patent application was a continuation of an earlier patent application submitted by Affymetrix where Fodor was a named co-inventor; this earlier submission did not contain the proprietary information and occurred *before* Fodor's review of the 1994 NCI Grant Proposal.

64. All of the unauthorized and illegal claims in patent application US6156501 were later struck down and invalidated by an independent panel of the United States Patent and Trademark Office (USPTO) which agreed that the content of the patent application had come from the NCI Grant Proposal.

F. Defendant Walt Hits a Dead End With His Randomly Selected Arrays.

65. On May 1, 1995, Dr. Francis Barany, collaborated, on a strictly confidential basis, with David R. Walt of Tufts University (Defendant Walt).

66. Dr. Barany explained, as an academic, the zip code chemistry, like its detection and use on "Universal Addressable Arrays", primers, and probes, for the encoding and decoding of DNA.

67. Defendant Walt admitted to Mike Goldman, the attorney working with Dr. Barany in submitting patents to the USPTO, on November 22, 1995, that he was neither a co-inventor of either the zip code chemistry nor universal addressable arrays.

68. The next year, in February 1996 and May 1996, Cornell University, as patent assignee of Dr. Francis Barany submitted two seminal patent applications (known as the '917 and '470 patent series for their representative patents US7083917 and US6797470) with significant data explaining the PCR-LDR, zip codes and Universal arrays.

69. These patents also taught PCR-PCR-LDR; LDR-PCR; PCR-PCR; zip code capture, as well as zip code primers and probes.

70. In December 1996, Defendant Walt of Tufts University published the use of beads and a hexagonal fiber-optic layout to detect DNA which relied on pre-hybridization with known sequences to mRNA and did not use zip codes.

71. Defendant Walt was aware of the limitations of his pre-hybridization/hexagonal fiber-optic process and on March 14, 1997 submitted a provisional patent application 08/818,199 (which becomes the '540 patent; US6023540) where he stated: "*there is no way, however to determine which probe sequence 60A, 60B, and 60C is generating the activity* since the *information* concerning which microsphere contained which probe sequence *was lost when the subpopulations were mixed.*"

72. In short, Defendant Walt's randomly assembled arrays could not work for large-scale genomic applications like SNP genotyping.

73. In April 1997, Defendant Mark Chee became the Director of Genomic research at Affymetrix.

E. Illumina and Affymetrix Conspire for Years to Misappropriate and Utilize the Plaintiffs Trade Secrets.

74. As stated, Defendant Chee had attempted to re-patent, on behalf of himself and Affymetrix, the proprietary information learned by Defendant Fodor when Fodor violated his confidential obligations when reviewing the Barany Team's NCI Grant proposal.

75. In October 1997, Defendant Walt submitted a patent application (which later becomes the '884 patent; US7115884) involving the dye in encoding of beads and once again, it neither envisions nor mentions the use of zip codes for decoding.

76. Then, on April 2, 1998, Defendants Walt, Chee, Gunderson and Fan founded the company Illumina Inc., with Defendant J. Flatley as the first CEO.

77. On September 15, 1998 Defendants Chee and Defendant Gunderson at Affymetrix submit a patent application (published as US20020012913) to sequence DNA using a Ligase enzyme with a DNA array.

78. As stated, Defendants Chee and Gunderson worked for Defendant Fodor at Affymetrix and Fodor only learned about combining Ligase enzyme specificity with array readout when he 'reviewed' (and then scuttled) the NCI Group Proposal.

79. Although, this US20020012913 patent application never issued, the actions of Defendants Chee, Fodor, Gunderson and Affymetrix manifested a clear intent to steal and then to exploit the trade secrets contained in the 1994 NCI Group Proposal.

80. Plaintiff Zirvi and Dr. Francis Barany, working together, developed procedures and proprietary information and rules for creating a robust set of zip code

sequences. On February 9, 1999, Plaintiff Zirvi completed the design of 4,633 zip codes including an *unpublished* set of 465 zip codes which was in a different order than the one published in a subsequent patent that was submitted by Plaintiff Zirvi and Dr. F. Barany on April 14, 2000 (known as the ‘965 patent series, US7455965). This document, by virtue of the unique order of its 465 zip code set, *which to this day is still unpublished*, becomes a *clear and unmistakable marker for the theft* of Dr. Zirvi’s trade secret, much like red ink exploding in a stack of bills stolen during a bank robbery.

81. On March 19, 1999, the Barany team submitted a patent application (known as the ‘594 patent, US6506594), which teaches PCR-LDR, zip codes, universal arrays, K-ras, BRCA1, BRCA2 and included substantial data.

82. On March 20, 1999, Defendants Gunderson and Chee, now at Illumina, submit a provisional patent application to decode beads using LDR and zip code capture, as **originally described by the Barany team in the 1994 NCI Grant Proposal and their 1996 ’917 patent.**

83. In other words, five years after the 1994 Barany team submitted their NCI Grant proposal and three years after the Barany team’s ’917 patent filings, Defendant Illumina unabashedly attempted to re-patent these breakthroughs under its own name.

84. Illumina’s patent application even had exactly the same ‘look and feel’ as Figure 3 from the Barany team’s patent.

85. On May 20, 1999, Defendant Gunderson submitted a provisional patent application 60/135,123 called “Addressing Arrays using sequence-specific adapters.”

86. In addition to being an outrageous attempt by Illumina to re-patent, and therefore steal or misappropriate, the trade secrets of the Barany team’s universal arrays,

zip code primers and zip code probes, which had been submitted in the two aforementioned patent applications three years earlier, (and later assigned to Cornell University,) Illumina shamelessly claimed, under oath, that “Universal adapters’ first described here.” It will be apparent to a person of ordinary skill in the art (POSA) that Illumina’s term of a “Universal adapter” was nothing more than an attempt to disguise that they were the zip code sequences described in the aforementioned Barany team patents.

87. In trying to get away with this unlawful re-patenting and appropriation of Plaintiffs’ trade secrets, Illumina rushed to submit 4 patent applications in one day.

88. Meanwhile, on June 23, 1999, Defendant Fan, who was still listed as being employed at Affymetrix, submitted a “Universal Arrays” patent application (60/140,359 which published as US20050074787) based on what Defendant Fodor learned in reviewing the 1994 NCI Group Proposal, the very portion of which was so denigrated by Defendant Fodor when he ‘reviewed’ that proposal and blocked it.

89. On August 8, 1999, pursuant to a confidential and exclusive joint development and licensing agreement between Cornell and PE Biosystems (now Defendant successor in interest Thermo Fisher Scientific), Dr. Francis Barany, prior to any patent filing of any kind, provided to Dr. Bill Efcavitch of P.E. Biosystems, several thousand zip code sequences of the universal array.

90. Dr. Bill Efcavitch of P.E. Biosystems was specifically instructed, in writing, by Dr. Francis Barany to “Please keep them under the Cornell/PE confidentiality agreement, as protection of this intellectual property is in progress.”

91. One month earlier, in July, 1999 Dr. Barany had previously referenced the strict confidentiality of the trade secrets when he had written to Dr. Bill Efcavitch “Also please find enclosed **confidential preprints** of our work on detecting mononucleotide and dinucleotide repeat sequences using LDR, in a format which is compatible with using the Universal array. (Emphasis provided).

92. Dr. Barany further confidentially disclosed to P.E. Biosystems; “We have a super set of top 64 (all tested already) or 96 zipcodes. **We have a larger set of 465, which includes the first set.** Finally, we have a set of 4,633 which includes the first two sets. These zipcodes are balanced for Tm and have been culled to eliminate cross-talk.”

93. Emphasis is added here because the only party to ever receive the strictly confidential and *unpublished* set of 465 zip codes was Dr. Bill Efcavitch of P.E. Biosystems.

94. At the time these trade secrets were confidentially disclosed to PE Biosystems there was a mutual understanding that they would shortly be patented.

95. Dr. Francis Barany, by virtue of the extreme sensitivity and value of these trade secrets, specifically stated he would set up a phone meeting “so we may discuss the best format to send the files to you (e.mail is not safe).”

96. On October 29, 1999, Defendant Gunderson (at Illumina) submitted a continuation of provisional application 60/135,123, said continuation application called 60/160,917 “Addressing Arrays using sequence-specific adapters.”

97. Gunderson filed Defendant Illumina’s “addressing arrays” continuation application admitting that the “adapters sequences” are for use on a “universal array”, yet Illumina, in order to deliberately cover their tracks of the theft of the Barany teams zip

codes, *removed* the Barany team's WO 97/31256 as a reference in the Illumina continuation application 60/160,917.

98. Illumina's "addressing arrays" patent continuation application on October 29, 1999 came just days before PE-Biosystems and Illumina signed a Joint Development Agreement (November 9, 1999) to co-develop the Barany team zip code chemistry (to which they obviously were never entitled) as described in the WO 97/31256 (now known as the Barany team '917 series patents).

99. On November 9, 1999 PE Biosystems and Illumina signed a joint development agreement to co-develop Barany team zip code chemistry described in WO 97/31256 ('917 series patents), with Defendant Walt's random bead arrays ('540 patent) which Walt himself had admitted he could not identify which probe sequence was where.

100. In short, PE-Biosystems (now Defendant Thermo Fisher Scientific) conspired with Defendant Illumina and provided Illumina with the strictly confidential and proprietary trade secret of the zip codes, referenced above and which, at the time, had not been patented.

101. P.E. Biosystems was the only corporation which had had access to the Zirvi-Barany *confidential and unpublished set of 465 zip codes* as well as to the Barany team IP protected information comprising the 1996 '917 series patents, the 1996 '470 series patents, and the 1999 '594 patent.

102. On December 23, 1999 Defendant Chee, with others, on behalf of Illumina, submitted a continuation patent application (60/172,106) to decode beads which now, after signing the Joint Development Agreement with PE Biosystems includes, for the first time, the Barany team zip code trade secret for decoding.

103. This provisional application (eventually becomes '754, US7033754) to decode beads also shows, for the first time; decoding arrays, clearly using the Barany team zip code trade secret with 16 zip codes. However, once again to hide the misappropriation and theft, Illumina deliberately concealed the sequence of oligonucleotides used and the actual hybridization and washing conditions used in all examples.

104. On February 7, 2000, Defendant Fan of Illumina submitted a provisional patent application, 60/180,810 where he attempted to re-patent the Barany team's LDR-PCR with universal array readout, as was articulated in the Barany 1996 '917 series patent, the Barany 1996 '470 series patent, and the Barany 1999 '293 series patent (represented as US6534293).

105. Illumina claimed, four years after the Barany team zip code patents were filed, that "Illumina has developed "Universal Bead Arrays" with 128 unique addresses that hybridize efficiently and with high specificity."

106. These "Universal Bead Arrays" are in fact the Zirvi-Barany Universal Zip Code Arrays. In that Illumina provisional patent application, 60/180,810, the "Universal Bead Arrays" are called "Zip-Code Arrays" in the title of their last figure, which tellingly is *deleted* from all subsequent patent applications from this patent family.

107. Significantly, when Illumina files a provisional patent application, 60/180,810 on February 7, 2000, entitled "Gene Expression Profiling" with Defendant Fan as the only inventor, Illumina admits that they make only randomly assembled arrays, invented by Defendant Walt, which uses beads that randomly settle into each well as liquid evaporates.

108. However, the application continues “in order to make use of the array, the identity of the bead at each location must be determined.” Illumina then admits that they use “P.E. Biosystems Zip Code TM chemistry.”

109. As is clear, from the foregoing, P.E. Biosystems never had any zip code TM chemistry except the Zirvi-Barany confidential and proprietary trade secret zip code sequences that they unlawfully, and in strict violation of their confidentiality agreement, illegally disclosed to Illumina.

110. They did so in order to benefit from their Joint Development Agreement with Illumina and ended up making millions of dollars from the misappropriation.

111. Meanwhile, on April 6, 2000, D. Lockhart at Affymetrix submitted “Universal arrays” patent application (60/195,585) clearly based on what Defendant Fodor learned from reviewing the 1994 NCI Grant Proposal.

112. As a consequence, Affymetrix was improperly granted patent US 7157564 “Tag array sequences” which was no more than the teachings of the Barany team’s Universal Array Sequences as set forth and described in the NCI Grant Proposal and improperly purloined by Defendant Stephen Fodor at Affymetrix. Affymetrix continued to actively pursue development of “Tag arrays” with Ligase enzyme-based detection technology in a two-year collaboration with ParAllele BioScience initiated in about 2003, and acquiring them in 2005 for \$120 million to pursue “a combination of Affymetrix’s GeneChip tag array and ParAllele’s MIP technology”. This is nothing more than combining the improperly purloined zip code array and LDR/PCR ideas from the Barany team NCI Grant Proposal.

113. On April 14, 2000, the Barany Team including Plaintiff Zirvi submits a provisional patent application (now known as the '965 patent series; US7455965), which describes PCR-LDR, 4,633 zip codes, Universal arrays, detection of low abundance K-ras mutations and included substantial data.

114. On July 27, 2000 Illumina goes public with its IPO, its SEC paperwork specifically referencing the Joint Development Agreement with WO 97/31256 (i.e. the Barany team '917 patent).

115. Pursuant to the IPO, Illumina raised \$96 million and applied for multiple SBIR NIH grants raising an additional \$28 million to commercialize the Golden Gate Assay (which is essentially what was described in Barany team's WO 97/31256 and '470 patent series).

116. Defendant Chee received 500,000 shares, Defendants Flatley and Walt received 1,000,000 shares each.

117. The IPO document claimed that Illumina would provide both services and products.

118. The Illumina collaboration with P.E. Biosystems brought \$134 million to Illumina in seven months, from the end of 1999 to mid-2000

119. Illumina's SNP genotyping was successful because it depended on Barany's '917 and '470 series zip code chemistry trade secrets.

120. The gene expression profiling, as envisaged by Defendant Walt failed for whole transcriptome profiling, and only worked when Illumina switched to Barany's addressable arrays and zip code chemistry.

121. Illumina never succeeded in developing a commercial product in Proteomics

122. Illumina never succeeded in developing a commercial product in High-Throughput Screening.

123. Illumina never succeeded in developing a commercial product in Chemical Detection.

124. In short, all of Illumina successful products are based entirely on the Barany team's purloined trade secrets.

125. On August 25, 2000, Defendants Chee and Gunderson, on behalf of Defendant Illumina blatantly copied the Barany team zip code IP in a patent application that published as US 20030096239. They submitted "universal array" sequences which they renamed Illumacodes (to disguise their tracks) directly plagiarizing and purloined in 16 of the Barany teams zip codes (then patented on behalf of assignee Cornell now known as the '965 patent series.)

126. Defendants even listed the 16 zip codes in Illumina's US 20030096239 in the same order as **Plaintiff Zirvi's original *unpublished* 465 zip code sequences.**

127. As stated, the only entity from which Illumina could have possibly received these unpublished, proprietary and secret 465 zip code sequences was P.E. Biosystems.

128. The chances of one new Illumina code zip code sequence matching exactly to Dr. Zirvi's work would be one in 281 trillion. That is less than the chances of winning the Powerball lottery. The chance of matching 16 zip code sequences in a row

would be far less than the chances of winning the Powerball lottery - 16 drawings in a row.

129. The chances of the first four bases of the 16 zip code sequences matching “TTGA” which is the first tetramer would be more than 1 billion times the total number of the stars in the universe.

130. The Barany team had described the properties of the zip code addresses which Illumina directly copied: (i) The Barany team described the zip code length of 24-mer “Illumacodes” 24-mer Illumina Adapter sequences “randomly picked by computer.” In actuality Illumina seeded the program with all 16 Zirvi-Barany zip codes; (ii) The Barany team describes uniform hybridization. >85% of melting temperature values, known as “Tm” values, were within the range of 75 – 80°C inclusive; Illumina claims random 24-mers with Tm centered around 72°C, and with a spread of 5 degrees which would be 67-77°C. In actuality, “IllumaCode” sequences also had Tm range of mostly 75-80°C inclusive, and almost all were 74-81°C, which is centered on the exact range the Barany team teaches. (iii) The Barany team describes 25% or greater differences between two zip code sequences. For 24-mers, that equals probe-decoder complementarity score **less than or equal to 18**; Illumina claims “Probe-Decoder complementarity Score < 14”. In actuality; there are: 1,461 pairs with complementarity score of exactly **14**; 338 pairs with complementarity score of exactly **15**; 70 pairs with complementarity score of exactly **16**; 22 pairs with complementarity score of exactly **17**; and 1 pair with complementarity score of **exactly 18**; -- which is exactly what the Barany team teaches, i.e. complementarity score of **less than or equal to 18**.

131. On September 26, 2000, Defendant Chee, and others at Defendant Illumina submitted a continuation of patent application (60/235,531) similar to (60/172,106) to decode beads, a process which was solely dependent on using the Barany team zip codes, they had no entitlement to.

132. On December 22, 2000, Defendant Chee and others at Illumina submitted a continuation of patent application (09/748,706) to decode beads and propose a primer-extension approach to decode arrays but submitted no evidence that this had ever worked.

133. This patent application became '754 (US7033754) and, interestingly the term "zipcode" was apparently systematically removed from the application. However, in their rush to disguise their trail, the Defendants missed the term "**zip code loci**" in Example 6 because it has a space between "zip" and "code" – yet they never *define* the term in the patent application. This would be as if Samsung used the word "iPhone" in their patent application with no explanation. This becomes yet another *marker for the theft* of the Barany team trade secrets.

134. On February 7, 2001, Defendant Fan, employee and agent of Defendant Illumina attempted to re-patent for themselves the Barany team's LDR-PCR with Universal Array readout as articulated in the Barany 1996 '917 series patents, the Barany 1996 '470 series patents, and the Barany 1999 '293 series patent.

135. On March 27, 2001 P.E. Biosystems and Illumina signed a **First Amendment to their Joint Development Agreement** which demonstrates that they conspired to provide "for the development and commercialization of Tag Sequence technology" which is just another way of describing zip code chemistry. Indeed, in the unredacted section 1.33 they admit that: "*Tag Sequence*" means ... the "addressable

array-specific portion" of the oligonucleotide probes and their complements described in International Patent Application No. WO97/31256.

136. The change of name to “Tag Sequence technology” was deliberately done to prevent the Barany team from ever finding out that Illumina and P.E. Biosystems were colluding to develop and commercialize trade secrets which had been stolen and from the Plaintiffs.

137. Illumina and PE Biosystems also colluded to jointly own “any Intellectual Property rights concerning Tag Sequences”...“Including the methods by which such Tag Sequences are designed, selected or made, as well as any compositions directly to such Tag sequences.”

138. Illumina and PE Biosystems in so doing, collectively acknowledge the high value of “Tag sequences” which in actuality, is the intellectual property of WO 97/31256, i.e. the zip code chemistry invented by Barany Team and Plaintiff Zirvi.

139. Further, since the unredacted section of the First Amendment to the Joint Development Agreement, of March 27, 2001, section 4.1.5 defines “Tag sequences” as being manufactured both on the array and as reagent, this confirms that both Illumina and P.E. Biosystems knew that “zip code” could be used to describe the oligonucleotide coupled to either solid support or in solution.

140. On August 18, 2004, Illumina and PE Biosystems signed a settlement agreement to end a lawsuit between them. They deliberately redacted the actual “Tag Sequences” from the 2004 settlement agreement, to hide from the plaintiffs the true nature of said “Tag Sequences”. Indeed the unredacted settlement agreement revealed “Tag sequences” to be 24 + 2 bases in length (addition of an extra “T” to both the 3’ and

5' end does not materially affect the performance characteristics of these sequences, just tries to disguise their true intellectual origin); Tag sequences differ from each other by 25% or more within those 24 bases, and are designed to operate under uniform hybridization conditions, in other words, they literally infringe upon the intellectual property of WO97/31256, i.e. the “Zip Code Chemistry” invented by the Barany team.

141. On July 12, 2001, Defendants Fan and Chee submit a provisional application (which becomes US 7582420) where they try to re-patent Barany team LDR-PCR array capture five years after the Barany team had submitted the ‘917 and ‘470 series patents.

142. In order to disguise their theft of the zip code sequences, Illumina renames the zip codes as; “Tag Sequence”, “IllumaCode,” or “IllumiCode.”

143. On August 27, 2001, Defendant Gunderson of Illumina submitted a full patent application 09/940,185 entitled “Probes and decoder oligonucleotides.” This was another attempt by Illumina to re-patent the exact zip code sequences and in doing so, to hide their tracks, they changed “IllumaCode ID” to “Seq. No. ID” and dropped Defendant Chee as an inventor when moving from the provisional to the full patent application.

144. Further, Illumina, through Defendants Gunderson and Chee, provided false testimony to the USPTO claiming to have invented the “Probes and decoder oligonucleotides” when in fact they had appropriated and plagiarized the first 16 zip codes directly from an *unpublished* Zirvi-Barany 465 Zip code file they obtained through Illumina’s collaboration with PE-Biosystems.

145. Tellingly, Illumina's attempt to re-patent these exact zip code sequences deletes the word "Universal Arrays" in the abstract to the USPTO in an effort to hide the fact that Illumina's application is actually the intellectual property of WO 97/31256.

146. Defendant Fan, on behalf of Illumina, submitted a grant application to the NIH on November 30, 2001 boasting their ability to generate more than 1 million genotypes per instrument per day. (SBIR 143CA097851-01 Grant). Illumina's achievement was based on the trade secrets of the Barany team -- in particular, the LDR-PCR, zip code, and Universal Array technology.

147. Defendant Chee, on behalf of Illumina, submitted a later grant application to the NIH, on May 28, 2002 (funded for \$15 million; 1U54HG002753), was also based on the trade secrets of the Barany team and in particular, the LDR-PCR, zip code, and Universal Array technology (patented on behalf of Cornell University in the Barany 1996 '917, 1996 '470 and 1999 '293 patent families).

148. On June 28, 2002, Defendant Chee and others at Defendant Illumina submit a continuation of patent application (10/187,321) to decode beads.

149. Although there are no new examples in this application, the new figure they provided reveals that approximately 1520 beads were correctly decoded which just happens to match the 1536-16 which equals 1520 functional beads types in the Gunderson et al. 2004 paper where the same data was derived by serial hybridization of pools to zip code oligonucleotides onto the addressable arrays.

150. On June 20, 2003 Defendant Gunderson of Illumina files a provisional application to cover Infinium arrays and once again hides the fact that these are really zip code addresses. It does this by deliberately omitting the zip codes from key figures in the

first application (which subsequently became US7670810) and removing all figures and examples in the second application, where Gunderson's name was not included as an inventor (published as US20100093550).

151. On March 24, 2004, by filing a patent application (which subsequently became US7467117) on normalization method for genotyping – eight years after the Barany team filed their zip code patents, which explained how ligation primers with zip code sequences worked – Illumina admits that ligation primers contain an address sequence (e.g. a zip code) which they term a “**universal tag sequence**,” which is captured by a “probe array,” with all the properties of the zip code address sequences.

152. Illumina's use of the term “**universal tag sequence**” (in US7467117) is another name for “*tag sequence*” which was defined in the redacted portion of the First Amendment to the Joint Development Agreement between Illumina and PE Biosystems, section 1.33, as being the “addressable array-specific portion” of the oligonucleotide probes and their complements, described in International Patent Application No. WO97/31256 (in other words, the Barany '917 series patents).

153. On January 8, 2018 Thermo Fisher and Illumina jointly announced “Ampliseq for Illumina” a product line based on the Barany '470 series patents. Illumina reported \$1,468 million revenue in FY17 from sequencing consumables, with approximately 70% or approximately \$1,027 million revenue from targeted resequencing.

154. The joint Thermo Fisher and Illumina “Ampliseq for Illumina” product line is ideal for targeted resequencing. As targeted resequencing is the basis for liquid biopsy and personalized medicine, AmpliSeq for Illumina may well generate sales in the hundreds of millions of dollars in a few years.

155. On January 26, 2018 Illumina was awarded \$26.7 million in a patent suit against Roche by claiming that Ariosa violated Illumina on US patent number 8,318,430 entitled “methods of fetal abnormality detection” and US patent number 7,955,794 entitled “multiplex nucleic acid reactions.”

156. In actuality, US patent 7,955,794 is the very same patent in which Illumina provided knowingly false information to the USPTO to overcome a rejection. The “patent” actually used methods based on the Barany ‘470 series LDR-PCR patent family, and were used against Ariosa, which used LDR-PCR.

G. How the Plaintiffs Discovered Defendants’ Misappropriation and Conspiracy

157. Only in 2018, did the Plaintiffs became aware that, not only did Fodor and Affymetrix submit and obtain a \$30 million grant from NIST-ATP Grant 70NANB5h1031 shortly after reviewing and rejecting the NCI Group Proposal, but that Jay Flatley, then CEO of Molecular Dynamics, and subsequently in 1998 as CEO of Illumina was a co-leader of that NIST grant proposal.

158. Further, in February of 2017 the Plaintiffs discovered that Jian-Bing Fan published a “Tag Array” paper in 2000 (which knowingly copied the Barany team “Enigma machine”), after he had moved to Illumina, relying on ‘work done’ a few years earlier while he was at Affymetrix.

159. Tellingly, that work was funded by the NIST grant 70NANB5h1031. The only other paper citing NIST funding to Affymetrix was about capillary gel electrophoresis and subsequently the Affymetrix projects ‘morphed’ to the Barany team “Enigma Machine” – i.e. “Universal Addressable Arrays” – which Affymetrix renamed as “Tag Arrays” to obfuscate their origin.

160. Indeed, while Fodor claimed no commercial conflict, it is apparent that NIST funding supported an Affymetrix patent application by David Lockhart (which blatantly copied the Barany team “Enigma machine” with Fodor’s name again conspicuously missing).

161. This patent application was submitted in April of 2000 but the Plaintiffs only became aware on August 7, of 2015 that Affymetrix had been improperly granted patent US7157564 for “Tag Array” sequences in 2007 which, as previously stated, were in essence the Barany team’s “Universal Array Sequences” of the “Enigma Machine”, which S. Fodor at Affymetrix had learned about when he had ‘reviewed’ the Barany team 1994 NCI Grant Proposal.

162. P. E. Biosystems was eager to produce the Universal Zip code Arrays in 1999 but needed critical information to make them commercial.

163. The **465 set** was created in February 1999 but it wasn’t until August 3 of 2015, after Zirvi was deposed in the *Cornell v Illumina* patent infringement case and asked by Illumina attorneys whether he had done anything to learn about what Illumina actually produced. He had not and, prior at that time, had no reason to do so.

163. However, the question caused Dr. Zirvi to investigate further and to review the Kevin Gunderson and Mark Chee patent application where he saw his exact 16 Zip codes as the first 16 “Illumacodes” (and then renamed “Seq. No. ID” to conceal the theft).

164. Dr. Zirvi realized, for the first time, that Illumina was founded by Fodor and Affymetrix employees, Mark Chee and Kevin Gunderson because they had access to the crucial proprietary information in the NCI Granted Proposal.

165. Following the trail, Dr. Zirvi could see that Illumina had created copycat derivative work with the same length and the same melting temperature values (Tm values) for use as zip code sequences in Universal Addressable Arrays.

166. This led to the investigation and discovery of numerous early patent applications and NIH SBIR Grants which included exact copies of key figures and techniques from the NCI 1994 Grant Proposal.

167. On August 7, 2015, Dr. Francis Barany asked Dr. Zirvi to help search a patent application submitted by Kevin Gunderson and Mark Chee to the USPTO on August 25, 2000.

168. This document had been submitted initially on paper and the table of sequences as images and not as searchable text.

169. This was very unusual for submissions to the USPTO because the USPTO requests electronic copies.

170. Using software to convert these images to text, Dr. Zirvi noted that *16 of the exact Zip code sequences designed by him in February, 1999 appeared as the first 16 sequences in the tables submitted by Kevin Gunderson and Mark Chee of Illumina!*

171. Not only did Illumina attempt to re-patent the **exact identical 16 Zirvi zip code sequences**: (i) Illumina tried to delete them from Table 1 - but accidentally left one with the wrong ID in Table 1; (ii) Illumina included all 16 of them in Table 2; and (iii) Illumina include them in a bizarre order in tables 3 & 4 – repeatedly attempting to hide their true origin. Further, Illumina’s “Illumacodes” sequence length also **matched the exact 24 bases** as designed by the Barany team.

172. Furthermore, Defendants Gunderson and Chee listed a number of other derivative works based on the proprietary specifications contained in the Plaintiffs' approach for designing zip codes for the Universal Addressable Array.

173. In reviewing the file wrapper for this patent submission, no reference to Dr. Francis Barany or to Dr. Monib Zirvi was found and, in addition, the original submission had labeled all the sequences '**Illumacode ID**', but that was changed to '**Seq. No. ID**' in later submissions in order to fraudulently hide their true origin.

174. The USPTO also specifically asked for electronic copies of these tables of sequences so that they could be searched for plagiarism or fraud.

175. In response the defendants submitted bizarrely rearranged tables with hand crossed out numbers and reordered tables.

176. The declarations and oaths signed by the Defendants clearly state the penalties for perjury for fraudulent claims of inventorship.

177. After, seeing that the 16 zip code sequences designed by Dr. Zirvi had appeared in a patent application by Illumina employees and by Defendants Gunderson and Chee, the Barany group of inventors undertook a thorough search of filings by both Affymetrix and Illumina to the NIH, SEC and USPTO.

178. In May 2017, FOIA requests to the SEC and NIH revealed documents that had significant portions redacted by Illumina.

179. Illumina's Q1 2001 SEC Filing contained Exhibit 10.13 also known as the First Amendment Agreement to the Joint Development Agreement (JDA), previously referenced in this complaint. A few critical paragraphs were redacted within the First

Amendment to the Joint Development Agreement when it was submitted by Illumina to the SEC.

180. In fact, the JDA was filed as an exhibit in Illumina's S-1 SEC filing for its IPO. The Joint Development Agreement was signed between defendants Perkin Elmer Biosystems (P.E Biosystems) and Illumina which included in part references to WO 97/31256 known in that document as Zip Code Chemistry.

181. As stated, Illumina in its IPO raised \$96 million dollars. The First Amendment Agreement stated that Perkin Elmer Biosystems and Illumina had developed Tag Sequences, **the definition of which was deliberately redacted in SEC Filings.** Certain key sections were specifically marked ***CONFIDENTIAL TREATMENT REQUESTED*.**

182. The un-redacted sections stated that the defendants were attempting to avoid Third Party Intellectual Property and other encumbrances. This was true in a sense. They were trying to avoid both patent litigation and trade secret litigation by third parties, based on their misappropriation and theft.

183. The Plaintiffs discovered, based on their FOIA request to the SEC, that the only thing redactions were concealing was the fraudulent renaming of zip code sequences as "Tag Sequences."

184. Further investigations by the Plaintiffs in Illumina's submissions to the USPTO and NIH SBIR programs via both patent database searches and FOIA requests, clearly show fraudulent oaths, declarations and references all choreographed to conceal the purloining of Plaintiffs' trade secrets and proprietary information.

185. In April 2017, via examination of the record in the *Scripps v Illumina* case, the Plaintiffs discovered two papers by Illumina in 2004 and 2006 (authored by Steinberg and Baker) to design the addressing scheme for Infinium arrays which used 4 of the 16 exact proprietary zip code sequences created by Plaintiff Dr. Monib Zirvi.

186. These were not able to be found by normal literature searches and online search engine searches because Illumina's employees did not reference any of the Plaintiffs in these two papers.

187. They also added an extra DNA base or letter "T" at the front of the sequence and extra spaces between the bases or letters to make it extremely difficult to search by computer for plagiarism, trade secret violations or theft of proprietary information.

188. Further investigation of the use of Tag Sequences by Defendant Jian-Bing Fan identified a publication sponsored by the NIST Research Grant 70NANB5h1031.

189. A search of this Grant showed that it was a joint grant between Defendant Affymetrix and Molecular Dynamics, submitted in 1994 shortly after defendant Stephen Fodor reviewed the Plaintiffs NCI Grant Application.

190. Defendant Jay Flatley was CEO of Molecular Dynamics at the time and became the first CEO of Illumina.

191. Defendant Walt founded Illumina to do genomic analysis using random beads but was only able to commercialize and mass produce genomic DNA arrays once the proprietary zip code sequences were used on the beads.

192. Defendant David Walt acted as the Chief Scientific Officer of Illumina for years and as such supervised and directed Defendants Kevin Gunderson, Mark Chee and Jian-Bing Fan.

193. For its array products, Defendant Illumina absolutely required the use of .dmap files which contain the sequences and X and Y locations associated with each bead on the array.

194. The Decode DMAP File Client software needed to analyze each of their arrays includes Dynamically Linked Library Files named CommonVeraScan.DLL and IlmnDataFiles.DLL.

195. Both of these Illumina programs contain the word “**ZipCode**” in their source code as the name of the sequences being analyzed – and since Illumina never defines the term in the software, this becomes yet another *marker for their theft*.

196. Defendant Illumina in multiple SEC Filings continued to add, as an exhibit, the First Amendment Agreement with the Tag Sequences Definition redacted and, it was discovered by the Plaintiffs in July 2018, that even in a 2004 Prospectus, Defendant Illumina raised \$65,000,000 in new share offerings with this misrepresentation to investors.

197. In April 2017, Defendants ThermoFisher and Illumina signed an agreement to shut down litigation in multiple jurisdictions (*Illumina vs Ion Torrent* in San Diego and *Cornell v Illumina* in Delaware) while concealing that they had actually been collaborating on Joint Development Project called “Ampliseq for Illumina”.

198. The Plaintiffs obtained definitive proof of this in May 2018 after discovering a January 8, 2018 SEC 8K filing by Defendant Illumina in which the current

CEO, Francis Desouza, in response to a question about the collaboration, clearly states that the discussions for **the collaboration had started over one year earlier.**

199. Defendant Illumina continues to claim that its “Tag Sequences” also known as “Illumacodes” and also known as “Illumicodes” or “adapter sequences” are its copyright and any derivative works are copyright as well.

200. From the Probes and Decoder Oligonucleotides tables it is clear that the first 16 ‘Illumacodes’ were never Illumina’s and therefore, any derivative work from those ‘Illumacodes’ are also are not the Defendants.

201. However, Defendant Illumina continues to fraudulently state otherwise to customers and investors.

COUNT ONE

VIOLATION OF DEFEND TRADE SECRETS ACT 18 U.S.C. §§ 1832, et seq.

Plaintiffs v. Defendants

202. Plaintiffs reallege and incorporate by reference all prior paragraphs of this complaint and paragraphs in the counts below as though set forth herein.

203. All defendants, either acting individually and/or in concert stole Plaintiffs’ trade secrets, as described more fully above.

204. The trade secret of “Universal Addressable Arrays” where information is encoded by “zip code sequences” and where zip code primers and probes are used in combination with enzymes such as “Ligases” to identify and detect cancer mutations, copy changes and other genome changes was first stolen in 1994 by Fodor.

205. Fodor, as the Chief Technology Officer of Affymetrix, used his employees Mark Chee, Jian-Bing Fan, and Kevin Gunderson, as knowing participants in an ongoing conspiracy to steal and to utilize Plaintiffs' trade secrets.

206. All of these defendants conspired, either separately or in concert to purloin Plaintiffs' the trade secrets through the consistent filing of fraudulent patent applications in an attempt to legitimize their theft. These 'patent applications,' continued unabated, from 1994 through at least 2004. Meanwhile, the Defendants continue to use, for their own enrichment, the trade secrets they had stolen.

207. As stated in more detail, hereinabove, the factual record is extent with Defendants' ongoing and relentless attempts to legitimize their theft so they can utilize it without legal recourse.

208. These attempts involved, *inter alia*, continued and ongoing fraudulent patent applications and/or provisional patent applications, skillfully crafted, which attempted to disguise the fact that Defendants were actually attempting to patent trade secrets which they had never developed and to which they were not entitled.

209. To execute this ongoing scheme, Defendants resorted to; filing improper and fraudulent provisional patent applications; filing improper and fraudulent continuing patent applications; fudging and or disguising the content of these patent filings in order to falsify and/or disguise the actual provenance of the trade secrets they were trying to patent or re-patent; omitting the Plaintiffs' names on patent applications or in articles; omitting references and /or acknowledgement of Plaintiffs' trade secrets defendants were utilizing for the successful and accurate application of their scientific processes which would not work without them; purposefully redacting documents from settlement

agreements and from publicly filed SEC documents; changing the nomenclature of the proprietary term 'zip code' in order to camouflage their theft; lying under oath to the USPTO; omitting disclosure, in an IPO and subsequent SEC filings, that successful delivery of services and products were dependent on Plaintiffs' trade secrets; omitting to disclose, and with mendacious deceit concealing, their misappropriation and theft of Plaintiffs' zip codes including, but not limited to, the zip code addresses, their length and their proprietary sequences; omitting to disclose, and with mendacious deceit concealing, their misappropriation and theft of Plaintiffs' LDR-PCR array capture.

210. The Defend Trade Secrets Act of 2016 ("DTSA" or "Act") expands the provisions of 18 U.S.C. § 1831 *et seq.* Defend Trade Secrets Act of 2016, ch. 90, 130 Stat. 376 (2016) (codified as amended at 18 U.S.C. 1831 *et seq.*).

211. The Act provides a federal cause of action to the owner of a trade secret that is misappropriated and is related to a product or service used in, or intended for use in, interstate or foreign commerce. 18 U.S.C. § 1836(b).

212. A trade secret is defined within DTSA as, *inter alia*, including "programs," "processes," and "codes," if (A) "the owner thereof has taken reasonable measures to keep such information secret; and (B) "the information derives independent economic value ... from not being generally known ... [or] readily ascertainable ... [to] another person who can obtain economic value from the disclosure or use of the information[.]" 18 U.S.C. 1839(3)(A)-(B).

213. In this case, the technical information was processes, programs and codes. The owners of the trade secrets took more than reasonable measures to keep their information secret relying first on the NIH/NCI regulations, and the legal obligations

assumed by a grant reviewer, requiring strict nondisclosure of the confidential information in the grant application. The zip codes in general and the 465 still unpublished zip codes in particular, were disclosed only to one party under a strict confidentiality agreement. All other trade secret information was never disclosed to any party until a detailed patent application could be drafted and filed.

214. Defendants disclosed and used Plaintiffs trade secrets, having used improper means to acquire them and, at the time of disclosure, and even today, knew or had reason to know that these trade secrets were acquired through improper means and under circumstances giving rise to a duty to maintain their secrecy or derived from or through a person who owed such a duty. 18 U.S.C. § 1839(5).

215. Further, although the DTSA was enacted in May 2016, the actions of Defendants are continuing misappropriations which continue to occur after that enactment date. As such, it is respectfully submitted that Plaintiffs have a viable continuing misappropriation claim that began because the DTSA defines misappropriation as the “*disclosure or use of a trade secret*” and Plaintiffs allege that Defendants continue to use the trade secrets to this day. Syntel Sterling Best Shores Mauritius Ltd. v. Trizetto Grp., Inc., 2016 U.S. Dist. LEXIS 130918, 2016 WL 5338550.

WHEREFORE, Plaintiffs demand judgment in their favor against all Defendants for their violations of the Defend Trade Secrets Act, and request actual and multiplied damages, attorneys' fees, and such other and further relief available under the Defend Trade Secrets Act as this Court deems just.

COUNT TWO

MISAPPROPRIATION OF TRADE SECRETS UNDER NEW YORK COMMON-LAW

Plaintiffs v. Defendants

216. Plaintiffs reallege and incorporate by reference all prior paragraphs of this complaint and paragraphs in the counts below as though set forth herein.

217. Plaintiffs' zip codes including, but not limited to, the zip code addresses, their length and their proprietary sequences, their use in LDR-PCR, their use in array capture were all trade secrets, as that term is defined by New York State law.

218. The Plaintiffs guarded the secrecy and confidentiality of these trade secrets, the information of which was of high value to their competitors, having cost a great deal of money and effort to create and which constituted a unique breakthrough, never duplicated by others. These trade secrets were never exposed to the public and their content was never in the public domain.

219. The trade secrets were accessed and used by the Defendants without authorization and their use was the result of discovery by improper means.

220. Defendants are still keeping the trade secrets confidential but nonetheless using them for their commercial advantage.

Wherefore, Plaintiffs request compensatory damages for lost profits caused by the misappropriation and an accounting of all of the Defendants' profits generated by the misappropriated trade secrets.

COUNT THREE

RICO – 18 U.S.C. § 1962(c)

Plaintiffs v. Flatley, Illumina Inc., Walt, Gunderson, Fan, Chee, Applied Biosystems.

221. Plaintiffs incorporate by reference all of the above paragraphs as if set forth fully herein.

222. Defendants Flatley, Illumina Inc., Walt, Gunderson, Fan, Chee, and Applied Biosystems were involved a scheme to defraud Plaintiffs by committing a series of unlawful acts which constitute predicate racketeering acts under 18 U.S.C. § 1962(c) over a prolonged period of time – in excess of two years – and multiple nefarious bad acts in several short spans during that same prolonged and more than two-year timeframe.

223. During this lengthy scheme to defraud Plaintiffs, Defendants Flatley, Illumina Inc., Walt, Gunderson, Fan, Chee, and Applied Biosystems committed predicate acts of racketeering activity, as defined in 18 U.S.C. § 1961(1), on multiple occasions and in violation of various federal statutes, including the Defend Trade Secrets Act, 18 U.S.C. §§ 1832, et seq., and the federal Mail and Wire Fraud statutes, 18 U.S.C. §§ 1314 and 1343.

224. For over two years and in a plan which is ongoing, Defendants Flatley, Illumina Inc., Walt, Gunderson, Fan, Chee, and Applied Biosystems and their representatives/employees worked in concert, committing numerous and repeated violations of the above federal statutes to harm Plaintiffs economically.

225. At various points in time, as specifically pled hereinabove, Defendants Flatley, Illumina Inc., Walt, Gunderson, Fan, Chee, and Applied Biosystems and their

representatives/employees misappropriated trade secrets of Plaintiffs through unlawful means, in violation of the DTSA.

226. Specifically, Defendants Flatley, Illumina Inc., Walt, Gunderson, Fan, Chee, and Applied Biosystems and their representatives/employees misappropriated and utilized, *inter alia*, Plaintiffs' trade secrets of "Universal Addressable Arrays," zip codes, their addresses, their length and their proprietary sequences including, but not limited to, the still unpublished 465 zip codes, the LDR-PCR, the array capture, and other proprietary information by downloading, stealing, copying without access, and sending it by electronic mail or regular mail – all in violation of the DTSA.

227. As part of this scheme, Defendants Flatley, Illumina Inc., Walt, Gunderson, Fan, Chee, and Applied Biosystems and their representatives/employees used an association-in-fact to accomplish their illegal goals and stole or utilized Plaintiffs' trade secrets, as well as hard copies of confidential zip code sequences and other documents, and provided them to Illumina Inc.

228. In perpetrating this scheme, Defendants Flatley, Walt, Gunderson, Fan, Chee, and Applied Biosystems and their representatives/employees used the Internet and mails to accomplish many of their goals in several states.

229. Specifically, in violation of the federal Mail and Wire Fraud statutes, Defendants Illumina Inc., Flatley, Waltz, Fodor, Gunderson, Fan Chee, and/or Applied Biosystems, their representatives/employees e-mailed, mailed or uploaded onto a Cloud-based platform, the Plaintiffs purloined trade secrets.

230. In turn, this information was sent and/or used by Defendants Illumina Inc., Flatley, Walt, Fodor, Gunderson, Fan, Chee, and Applied Biosystems, for their advantage and to the disadvantage of the Plaintiffs.

231. Some of the specific acts of mail and wire fraud include, but are not limited to, the use, by the Defendants, of the United States Postal Service to deliver knowingly fraudulent patent applications, patent continuations and patent renewals in a scheme to steal Plaintiffs' trade secrets.

232. Further, Defendants Flatley, Illumina Inc., Walt, Gunderson, Fan, Chee, and Applied Biosystems and their representatives/employees, in order to exploit the significant economic opportunities of Plaintiffs' trade secrets, retained (and still retain) possession of them, sharing, and having shared, and/ or having communicated the confidential content these trade secrets with each other but specifically to Illumina Inc.

233. It is submitted this sharing, disclosure and/or communication, as described above, occurred on occasions too numerous to count, via the Internet, fax, regular mail or e-mail.

234. Their orchestrated scheme to steal the Plaintiffs' trade secrets involved a multi-pronged attack including, but not limited to, the filing of improper, fraudulent and sometimes perjuriously submitted patent applications, provisional patent applications and renewed patent applications, all in an attempt to appropriate the trade secrets, legitimize their theft and then utilize them for these Defendants' sole financial gain and without fear of any litigation.

235. Defendants further, in their ongoing attempts to legitimize their ongoing theft of Plaintiff's trade secrets, willfully omitted any reference and/or acknowledgment

to their provenance, deliberately creating the false impression that the trade secrets were theirs when they knew they were not and knew also that their theft was critical to the services and products sold and manufactured by Illumina.

236. More importantly, for the purposes of 18 U.S.C. § 1961(5), Plaintiffs' trade secrets were actually stolen and utilized.

237. Briefly, these thefts included but were not limited to; the super set of top 64 (all tested already) or 96 zip codes; the larger unpublished set of 465 zip codes; the set of 4,633 zip codes; the "Universal Bead Arrays" which were the Zirvi-Barany Universal Zip Code Arrays; the "universal array" sequences renamed 'Illumacodes' which were 16 of the Barany team's zip codes; a patent by Illumina Inc., to decode 'beads' which was solely dependent on using the Barany team zip codes; the Barany team's LDR-PCR with Universal Array readout and the appropriation of 'Tag Sequence technology' i.e.; zip code chemistry.

238. It is submitted that the individual Defendants communicated with one another by electronic means and across state lines in furtherance of their scheme to steal and exploit Plaintiffs' trade secrets.

239. As set forth above, these actions were many and occurred over a prolonged period of time, at least from the founding of Illumina Inc., in 1998 through to the present.

240. Ilumina Inc. continues, to this day, to provide services and manufacture products, the *sine qua non* of which are Plaintiffs' trade secrets.

241. Illumina Inc. engages in, and its activities affect, interstate commerce.

242. Further, Illumina Inc., operates in numerous states and was used in furtherance of the scheme to steal and exploit Plaintiffs' trade secrets.

243. In fact, Illumina Inc. provided the enterprise through which Defendants Applied Biosystems, Flatley, Walt, Gunderson, Fan and Chee carried out their fraudulent activities, as described above.

244. The main commercial purpose Illumina Inc., was to steal and use Plaintiffs' trade secrets through a pattern of racketeering activity, which itself was a series of continuous acts in violation of federal laws over more than two years, including the actual theft of trade secrets and mail and wire fraud, as stated.

245. Each of the predicate acts were perpetrated by these same Defendants while participating in the conduct of the affairs of an enterprise – in this case Illumina Inc.,— through a pattern of racketeering activity described herein, in violation of 18 U.S.C. § 1962(c).

246. As a direct and proximate result of the pattern of racketeering activity, by and through each of the unlawful acts recited herein, Plaintiffs have been injured, and continue to be injured, in their business, reputation, intellectual standing, and property, including, but not limited to, their trade secrets, drawings, intellectual property and protected business information and the royalties therefrom.

WHEREFORE, Plaintiffs demand judgment in their favor for Defendants violation of 18 U.S.C. § 1962(c), and request all available statutory remedies, actual, multiplied, and punitive damages, and such other and further relief as this Court deems just.

COUNT FOUR

RICO – 18 U.S.C. § 1962(d)

Plaintiffs v. Flatley, Illumina Inc., Walt, Gunderson, Fan, Chee, Applied Biosystems.

247. Plaintiffs incorporate by reference all of the above paragraphs as if set forth fully herein.

248. Defendants Flatley, Walt, Gunderson, Fan, Chee, Applied Biosystems and/ or Illumina Inc., knowingly agreed to facilitate a scheme, a conspiracy, to defraud Plaintiffs through a pattern of interstate racketeering activity, which included the operation and/or management of a RICO enterprise.

249. As set forth above, Defendants Flatley, Walt, Gunderson, Fan, Chee, Applied Biosystems and/ or Illumina Inc., were involved a scheme to defraud Plaintiffs by committing a series of unlawful acts which constitute predicate racketeering acts under 18 U.S.C. § 1962(c) over a prolonged period of time – in excess of two years.

250. During this lengthy scheme to defraud Plaintiffs, Defendants Flatley, Walt, Gunderson, Fan, Chee, Applied Biosystems and/ or Illumina Inc., committed predicate acts of racketeering activity, as defined in 18 U.S.C. § 1961(1), on multiple occasions and in violation of various federal statutes, including the Defend Trade Secrets Act, 18 U.S.C. §§ 1832, et seq and the federal Mail and Wire Fraud statutes, 18 U.S.C. §§ 1314 and 1343.

251. For over two years and in a plan which is ongoing, Defendants Flatley, Walt, Gunderson, Fan, Chee, Applied Biosystems and/ or Illumina Inc., and their

representatives/employees worked in concert with one another, committing numerous and repeated violations of the above federal statutes to harm Plaintiffs economically.

252. At various points in time, Defendants Flatley, Walt, Gunderson, Fan, Chee, Applied Biosystems and/ or Illumina Inc., and their representatives/employees misappropriated trade secrets of Plaintiffs through unlawful means, in violation of the DTSA.

253. Specifically, Defendants Flatley, Walt, Gunderson, Fan, Chee, Applied Biosystems and/ or Illumina Inc., and their representatives/employees took trade secrets and other proprietary information by downloading, stealing, copying without access, and sending it by electronic mail – all in violation of the DTSA.

254. As part of this scheme, Defendants Flatley, Walt, Gunderson, Fan and Chee used an association-in-fact to accomplish their illegal goals to steal trade secrets, as well as hard copies of confidential drawings and other documents, and provided them to Illumina.

255. In perpetrating this scheme, Defendants Flatley, Walt, Gunderson, Fan and Chee and/or Ilumina Inc.'s representatives/employees used the Internet and mails to accomplish many of their goals in several states.

256. Specifically, in violation of the federal Mail and Wire Fraud statutes, Defendants Flatley, Walt, Gunderson, Fan and Chee and/or Ilumina Inc.'s representatives/employees e-mailed or uploaded onto a Cloud-based platform Plaintiffs' proprietary data.

257. In turn, this information was sent and/or used by Defendants Flatley, Walt, Gunderson, Fan and Chee and/or Illumina Inc.'s representatives/employees for their advantage and to the disadvantage of Plaintiffs.

258. The association-in-fact conspired to defraud the Plaintiffs through a pattern of illegal acts, as recited in part above.

259. This association-in-fact changed and grew over time, but had a structure in that it had leadership in the persons of Walt, Fan and Flatley among others including high level Illumina employees.

260. Meetings of the group were conducted, and plans to further the scheme against Plaintiffs were created and discussed during these meetings, whether in person or by telephone or by electronic mail.

261. The leadership decided on strategy and executed a plan to steal and exploit Plaintiffs' trade secrets by committing a pattern of racketeering activity, which was a series of continuous acts in violation of federal laws over more than two years, including, but not limited to, theft of trade secrets, and mail and wire fraud recited above.

262. The association-in-fact was engaged in interstate commerce, in that it solicited investment, applied for grants, manufactured products, provided services and exploited the Plaintiffs trade secrets in multiple jurisdictions.

263. Each of the predicate acts perpetrated by these same Defendants in furtherance of the scheme to defraud Plaintiffs was performed by these same Defendants while participating in the conduct of the affairs of an enterprise – whether that enterprise Illumina, or an association-in-fact comprised of Defendants Flatley, Walt, Gunderson,

Fan and Chee— through a pattern of racketeering activity described herein, in violation of 18 U.S.C. § 1962(c).

264. As a direct and proximate result of the pattern of racketeering activity, by and through each of the unlawful acts recited herein, Plaintiffs have been injured, and continue to be injured, in their business, reputation, intellectual standing, and property, including, but not limited to, their trade secrets, drawings, intellectual property and protected business information and the royalties therefrom.

WHEREFORE, Plaintiffs demand judgment in their favor for Defendants violation of 18 U.S.C. § 1962(d), and request all available statutory remedies, actual, multiplied, and punitive damages, and such other and further relief as this Court deems just.

COUNT FIVE

BREACH OF FIDUCIARY DUTY

Plaintiffs v. Fodor and Thermo Fisher Scientific

265. Paragraphs 1 through 264 are incorporated by reference as if set forth fully herein.

266. Fodor, having promised to fairly and impartially review Plaintiff's NCI Grant Proposal to the National Cancer Institute, did the exact opposite.

267. Fodor, unfairly and improperly, and in direct violation of his obligations, reviewed the NCI Grant Proposal so negatively that Plaintiffs were refused like their grant.

268. Fodor did this to obstruct the Plaintiffs in developing their breakthrough ideas and to steal the Plaintiffs' proprietary trade secrets for himself.

269. Although the NCI Grant Proposal was submitted by, inter alia, Plaintiff Lubin and the Barany Team, Fodor through his company Affymetrix, (now a part of Thermo Fisher Scientific,) responsible for all the consequential damages to all the Plaintiffs for having stolen the Barany Team's trade secrets and utilizing them for himself and the company he owned.

270. Fodor by himself and through Affymetrix through their actions as set forth herein, intentionally and willfully violated their fiduciary duties to the Plaintiffs by taking actions against their interest while by stealing, usurping and exploiting Plaintiffs' trade secrets, as described more fully herein.

271. Affymetrix was Fodor's agent in his willful and intentional violations of his duty of loyalty.

272. They engaged in self-dealing, misrepresentations, fraud, and conspiracy, and competed with the Plaintiffs improperly and for their own economic benefit.

273. As a direct and proximate result of the Defendants' acts and omissions, the Plaintiffs have suffered substantial damages and Defendants unlawfully profited.

274. The Defendants' actions were willful and outrageous and undertaken with reckless indifference to the rights of the Plaintiffs.

COUNT SIX

FRAUD

MISREPRESENTATION / FAILURE TO DISCLOSE

Plaintiffs v. Defendants

275. Paragraphs 1 through 274 are incorporated by reference as if set forth fully herein.

276. Defendants, on a continual basis, throughout their filing of improper, fraudulent and false patents, materially misrepresented that they owned or had developed the trade secrets contained therein.

277. All Defendants submitted false and materially misleading patent applications, re-applications, renewals and continuations, as set forth in more detail above.

278. Defendants made continual and varied misrepresentations to indicate that they were the owners of, or the inventors of, unique trade secrets which belonged solely to, and had been created entirely by, the Plaintiffs.

279. The Defendants, in perpetrating this pattern of fraud and misrepresentation, did so for their own economic benefit and to the financial and reputational detriment of Plaintiffs.

280. As a direct and proximate result of the Defendants' acts and omissions, the Plaintiffs have suffered substantial damages and the Defendants have unlawfully profited.

281. The Defendants' actions have been willful and outrageous and undertaken with reckless indifference to the rights of the Plaintiffs.

COUNT SEVEN

TORTIOUS INTERFERENCE WITH PROSPECTIVE ECONOMIC ADVANTAGE

Plaintiffs v. Defendants

282. Paragraphs 1 through 281 are incorporated by reference as if set forth fully herein.

283. Defendants, by virtue of their theft of Plaintiffs' trade secrets and exploitation thereof, deprived the Plaintiffs of valuable economic advantages.

284. Plaintiffs had developed these valuable trade secrets and that information would provide Plaintiffs with an advantage over their competitors.

285. As such, the Plaintiffs had a reasonable expectation of economic advantage that has been lost as a result of Defendants' improper and malicious interference through their misappropriation of Plaintiffs' trade secrets and confidential.

286. As a direct and proximate result of Defendants' interference, Plaintiffs have suffered substantial damages.

287. Defendants' actions have been willful and outrageous and undertaken with reckless indifference to the rights of Plaintiffs.

COUNT EIGHT

CIVIL CONSPIRACY

Plaintiffs v. Defendants

288. Paragraphs 1 through 287 are incorporated by reference as if set forth fully herein.

289. As stated in detail herein, the Defendants agreed, combined and acted with a common plan and purpose to defraud, misappropriate and utilize the Plaintiffs' trade secrets, by engaging in the unlawful acts described above.

290. The Defendants agreed, combined and acted with a common plan to breach their fiduciary and other common-law duties owed to the Plaintiffs by engaging in the unlawful acts described above.

291. Upon information and belief, the Defendants committed overt acts, as described above, including, but not limited to, the unauthorized taking of trade secrets and confidential information, and competing, in an unfair manner, against the Plaintiffs.

292. As a direct and proximate result of the acts done in furtherance of the conspiracy, the Plaintiffs have been damaged, and will continue to suffer economic and reputational injury.

293. As a direct and proximate result of the Defendants' conspiracy, the Plaintiffs have suffered substantial damages.

294. The Defendants' actions have been willful and outrageous and undertaken with reckless indifference to the rights of the Plaintiffs.

COUNT NINE

BREACH OF CONFIDENCE

Plaintiffs v. Fodor, Affymetrix Inc.

295. Paragraphs 1 through 294 are incorporated by reference as if set forth fully herein.

296. As stated in detail herein, Fodor while on a confidential NIH study section did in fact breach the confidential details learned while reviewing the NCI grant and share such information for personal gain.

297. The Defendants acted either singly or in concert to breach duties of confidence owed to the Plaintiffs by engaging in the unlawful acts described above.

298. Upon information and belief, the Defendants committed overt acts, as described above, including, but not limited to, the unauthorized taking of trade secrets and confidential information, and competing, in an unfair manner, against the Plaintiffs.

299. As a direct and proximate result of the acts done as a result of this breach of confidence, Plaintiffs have been damaged and will continue to suffer economic and reputational injury.

300. As a direct and proximate result of the Defendants' breach of confidence, the Plaintiffs have suffered substantial damages.

311. The Defendants' actions have been willful and outrageous and undertaken with reckless indifference to the rights of the Plaintiffs.

COUNT TEN

UNJUST ENRICHMENT

Plaintiffs v. Defendants.

312. Paragraphs 1 through 311 are incorporated by reference as if set forth fully herein.

313. Through their fraudulent conduct, theft, breach of their fight judiciary duties and duties of loyalty, unfair competition, and misappropriation of trade secrets and confidential information, Defendants received a benefit from Plaintiffs, including, but not limited to, business opportunities and corresponding monies to which Defendants were not entitled.

314. Defendants, have improperly, and without the consent of Plaintiffs, retained these monies.

315. Defendants had and have no legitimate entitlement to these monies.

316. The retention and taking of these monies is both inequitable and unjust.

317. As a direct and proximate result of the Defendants' unjust enrichment, the Plaintiffs have suffered substantial damages.

318. The Defendants' actions have been willful and outrageous and undertaken with reckless indifference to the rights of the Plaintiffs.

COUNT ELEVEN

UNFAIR TRADE PRACTICES

Plaintiffs v. Flatley, Walt, Illumina Inc.

319. Paragraphs 1 through 318 are incorporated by reference as if set forth fully herein.

320. As stated in detail herein, the Defendants agreed, combined and acted with a common plan and purpose to defraud, misappropriate and to utilize the Plaintiffs' trade secrets, by engaging in the unlawful acts described above.

321. The Defendants agreed, combined and acted with a common plan to mislead the Plaintiffs by redacting the key paragraphs from the First Amendment Agreement to hide the definition of "Tag Sequences" as zip code sequences as defined in WO 97/31256. They further mislead the Plaintiffs and consumers by renaming said zip code sequences as "Adapters", "Tag Sequences", "Illumacodes" and "Illumicodes" to hide their true origin and function. Yet, buried in Illumina's own Decode DMAP File Client software [needed to analyze each of their arrays includes Dynamically Linked Library Files named CommonVeraScan.DLL and IlmnDataFiles.DLL] they contain the word "ZipCode", yet Illumina kept that term hidden from the average customer, and never defined it in their software because they knew that it was an indelible marker of their theft. It was a fraud, not simply on the Plaintiffs, but on Illumina's own customers and investors.

322. Upon information and belief, the Defendants committed overt acts, as described above, including, but not limited to, the unauthorized taking of trade secrets and confidential information, and competing, in an unfair manner, against the Plaintiffs.

323. As a direct and proximate result of these unfair trade practices, the Plaintiffs have been damaged, and will continue to suffer economic and reputational injury and their ability to compete in the marketplace.

324. As a direct and proximate result of these unfair trade practices, the Plaintiffs have suffered substantial damages.

325. The Defendants' actions have been willful and outrageous and undertaken with reckless indifference to the rights of the Plaintiffs.

COUNT TWELVE

CONVERSION/THEFT/EMBEZZLEMENT

Plaintiffs v. Defendants

326. Plaintiffs incorporate paragraphs 1 through 325 as if set forth at length.

327. At all relevant times, as set forth in this complaint, Plaintiffs retained all right, title, and interest in their trade secrets.

328. Defendants knowingly, dishonestly, and intentionally took and retained Plaintiffs trade secrets and other information without authorization.

329. Defendants' acts constitute a knowing, unlawful and intentional conversion of trade secrets and information for Defendants economic benefit and to the economic detriment of the Plaintiffs.

330. As a direct and proximate result of this conversion, Plaintiffs have suffered substantial damages.

331. Defendants actions of been willful and outrageous and undertaken with reckless indifference to the rights of the Plaintiffs.

PRAYER FOR RELIEF

WHEREFORE, the Plaintiffs request the following relief: (a) Defendants be directed to immediately disclose to the Plaintiffs how and where they are utilizing Plaintiffs' trade secrets; (b) return to the Plaintiffs all documents, electronic files, and information referencing, relating to or referring to Plaintiffs' trade secrets and destroy any derivative work; (c) Plaintiffs be awarded compensatory damages, trebled, and punitive damages, prejudgment and post-judgment interest, reasonable attorneys' fees, and costs; (d) The Defendants be required to disgorge any revenues, income or profits earned from stealing Plaintiffs' trade secrets; (e) All Defendants be jointly and severally liable to the Plaintiffs; and (f) Plaintiffs be awarded such other and further necessary and proper relief as the Court may deem just and proper.

Respectfully submitted,

KOLMAN ELY, P.C.

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